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(54) Title: ANTIPERSPIRANT COMPOSITION

(57) Abstract: The present disclosure provides an antiperspirant composition that includes active component and an inactive component. The antiperspirant composition can be present as a stick antiperspirant, a body spray, a clear gel, or an aerosol antiperspirant. The active component can include an aluminum salt, a magnesium salt, a film former, an extract solution, or a mixture thereof. The extract solution can include nymphaea coerulea flower extract and nelumbo nucifera flower extract.



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## ANTIPERSPIRANT COMPOSITION

**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims priority to United States Provisional Patent  
5 Application No. 63/160,343, filed on March 12, 2021 and titled ANTIPERSPIRANT  
COMPOSITION, the contents of which are hereby incorporated by reference.

**BACKGROUND**

[0002] Consumers desire antiperspirant and deodorant compositions that provide a  
10 desired and long-lasting fragrance or scent each time the composition is applied or used.  
Particularly in the case of deodorants, consumers may also expect compositions that provide  
a scent that can mask or override other undesirable odors.

**SUMMARY OF THE DISCLOSURE**

15 [0003] The present disclosure provides an antiperspirant composition that includes  
active component and an inactive component. The antiperspirant composition can be present  
as a stick antiperspirant, a body spray, a clear gel, a roll on, a cream, or an aerosol  
antiperspirant. The active component can include aluminum salt, magnesium salt, film  
former, extract solution, or a mixture thereof. The extract solution can include nymphaea  
20 coerulea flower extract and nelumbo nucifera flower extract.

**DETAILED DESCRIPTION**

[0004] Reference will now be made in detail to certain embodiments of the disclosed  
subject matter. While the disclosed subject matter will be described in conjunction with the  
25 enumerated claims, it will be understood that the exemplified subject matter is not intended to  
limit the claims to the disclosed subject matter.

[0005] Throughout this document, values expressed in a range format should be  
interpreted in a flexible manner to include not only the numerical values explicitly recited as  
the limits of the range, but also to include all the individual numerical values or sub-ranges  
30 encompassed within that range as if each numerical value and sub-range is explicitly recited.  
For example, a range of “about 0.1% to about 5%” or “about 0.1% to 5%” should be  
interpreted to include not just about 0.1% to about 5%, but also the individual values (e.g.,  
1%, 2%, 3%, and 4%) and the sub-ranges (e.g., 0.1% to 0.5%, 1.1% to 2.2%, 3.3% to 4.4%)

within the indicated range. The statement “about X to Y” has the same meaning as “about X to about Y,” unless indicated otherwise. Likewise, the statement “about X, Y, or about Z” has the same meaning as “about X, about Y, or about Z,” unless indicated otherwise.

**[0006]** In this document, the terms “a,” “an,” or “the” are used to include one or more than one unless the context clearly dictates otherwise. The term “or” is used to refer to a nonexclusive “or” unless otherwise indicated. The statement “at least one of A and B” has the same meaning as “A, B, or A and B.” In addition, it is to be understood that the phraseology or terminology employed herein, and not otherwise defined, is for the purpose of description only and not of limitation. Any use of section headings is intended to aid reading of the document and is not to be interpreted as limiting; information that is relevant to a section heading may occur within or outside of that particular section.

**[0007]** According to various aspects of the present disclosure an antiperspirant composition can include an active component and an inactive component. The antiperspirant composition can be present as a stick antiperspirant, a body spray, a clear gel, a roll on, a cream, or an aerosol antiperspirant. The active component can include an aluminum salt or magnesium salt, a film former, and an extract solution. The extract solution can include *nymphaea coerulea* flower extract and *nelumbo nucifera* flower extract. It has been surprisingly and unexpectedly found that the combination the aluminum salt, magnesium salt, film former, extract solution, or a mixture thereof can produce an antiperspirant composition that is capable of reducing perspiration by 40% to 70%, or from 55% to 65%, less than, equal to, or greater than about 40%, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, or about 70% over a time in a range of from about 40 hours to 100 hours, or from 90 hours to 100 hours, less than, equal to, or greater than about 40 hours, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, or about 100 hours—relative to an untreated portion of skin or an antiperspirant composition that is free of any of the three components. Without intending to be bound by any theory, it is suspected that the increased performance of the instant antiperspirant composition can be at least partially attributed to the role of the extract solution acting on preventing perspiration that is produced and not able to be blocked or absorbed by the aluminum salt or magnesium salt. Aluminum salts have a maximum amount of perspiration that they are able to address and the extract solution is thought to address the excess amount. The film former is thought to be able to facilitate

substantial homogenation of the extract solution and aluminum salt and evenly distribute the solution about a user's skin.

**[0008]** The extract solution can be NELUPURE, available from Centerchem.

NELUPURE includes propanediol, glycerin, nymphaea caerulea flower extract, and nelumbo  
5 nucifera flower extract.

**[0009]** The aluminum salt or magnesium salt can constitute any suitable amount of the antiperspirant composition can be in a range of from about 1 wt% to about 55 wt%, 25 wt% to 55 wt%, about 1 wt% to about 10 wt% of the active component, about 35 wt% to about 45 wt% of the active component, less than, equal to, or greater than about 25 wt%, 26,  
10 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, or about 55 wt%. Antiperspirant salts useful as antiperspirant salts or as components of antiperspirant complexes include aluminum halides, aluminum hydroxy-halides, zirconyl oxyhalides, zirconyl hydroxy-halides, and mixtures of these materials. A specific aluminum salt can include aluminum sesquichlorohydrate.

**[0010]** Examples of magnesium salts include magnesium carbonate, magnesium carbonate, magnesium oxide, magnesium hydroxide, magnesium citrate, magnesium chloride, or a mixture thereof. Where the magnesium salt is used, a ratio of the magnesium salt to the NELUPURE can be in a range of from about 0.5:8, 1:2, 1:5, or 2:8.

**[0011]** Aluminum salts of this type include aluminum chloride and the aluminum  
20 hydroxyhalides having the general formula  $Al_2(OH)_xQ_yXH_2O$  where Q is chlorine, bromine or iodine; where x is from about 2 to about 5, and  $x+y$ =about 6, and x and y do not need to be integers; and where X is from about 1 to about 6. Aluminum salts of this type can be prepared in the manner described more fully in U.S. Pat. No. 3.887.692 issued to Gilman on Jun. 3, 1975, and U.S. Pat. No. 3.904.741 issued to Jones and Rubino on Sep. 9, 1975.

**[0012]** The zirconium compounds which are useful in the present invention include both the zirconium oxy salts and zirconium hydroxyl salts, also referred to as the zirconyl salts and zirconyl hydroxy salts. These antiperspirant actives are further described in US 7897799 Specific antiperspirant active salts usable in the formula embodiment include one or  
25 more of the following: aluminum zirconium tetrachlorohydrate glycine complex with zinc glycinate and aluminum zirconium tetrachlorohydrate glycine complex with a salt other than zinc glycinate such as sodium glycinate and other water soluble amino acid salts such as sodium alginate. Other active solid antiperspirants include aluminum chlorhydrate, aluminum sesquichlorohydrate, aluminum zirconium trichlorohydrate glycine, aluminum zirconium pentachlorohydrate glycine, aluminum zirconium tetrachlorohydrate glycine and aluminum

zirconium octochlorohydroxide glycine. The aluminum zirconium-containing materials are commonly referred to as antiperspirant active aluminum zirconium salts. Generally, the foregoing metal antiperspirant active materials are antiperspirant active metal salts listed in the Federal Register, Vol. 68, No. 110/Monday, Jun. 9, 2003/Rules and Regulations.

5 **[0013]** Salts useful as antiperspirant salts or as components or complexes include aluminum halides, aluminum hydroxy-halides, zirconyl oxyhalides, zirconyl hydroxy-halides, and mixtures of these materials.

**[0014]** The film former can be in a range of from about 1 wt% to 20 wt%, 2 wt% to about 20 wt% of the active component, about 7 wt% to about 13 wt% of the active  
 10 component, less than, equal to, or greater than about 2 wt%, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or about 20 wt%. As described herein above, the film former can be used to help produce a homogenous mixture of the aluminum salt and the extract solution as well as help to evenly distribute the antiperspirant composition about a user's skin. According to various aspects, the film former can include Acrylates Copolymer, Acrylates Copolymer  
 15 (and) Acrylates/Polytrimethylsiloxymethacrylate Copolymer, ACRYLATES/OCTYLACRYLAMIDE COPOLYMER, Acrylates/C1-2 Succinates/Hydroxyacrylates Copolymer, Acrylates/C12-22 Alkyl Methacrylate Copolymer, Acrylates/Dimethicone Copolymer, Acrylates/Ethylhexyl Acrylate Copolymer, Acrylates/Hydroxyesters Acrylates Copolymer, Acrylates/Lauryl Acrylate/Stearyl Acrylate/Ethylamine Oxide Methacrylate  
 20 Copolymer, Acrylates/Octylacrylamide Copolymer Acrylates/Polytrimethylsiloxymethacrylate Copolymer, Acrylates/Polytrimethylsiloxymethacrylate Copolymer (and) Laureth-1 Phosphate, Acrylates/t-Butylacrylamide Copolymer, Adipic Acid/Diglycol Crosspolymer, Adipic Acid/Neopentyl Glycol/Trimellitic Anhydride Copolymer, Algin Aluminum Starch  
 25 OctenylsuccinateAMP-Acrylates Copolymer, Behenyl Methacrylate/t-Butyl Methacrylate Copolymer, Brassica Campestris/Aleurites Fordi Oil Copolymer, Butyl Acrylate/Hydroxypropyl Dimethicone Acrylate Copolymer, Butyl Ester of PVM/MA Copolymer, C24-28 Alkyldimethylsiloxy Trimethylsiloxysilicate, Capryloyl Glycerin/Sebacic Acid Copolymer, Diisostearoyl Polyglyceryl-3 Dimer Dilinoleate, Ethyl  
 30 Ester of PVM/MA Copolymer, Isobutylene/Ethylmaleimide/Hydroxyethylmaleimide Copolymer, Isopropyl Ester of PVM/MA Copolymer, Methacryloyl Ethyl Betaine/Acrylates Copolymer, Octylacrylamide/Acrylates/Butylaminoethyl Methacrylate Copolymer, Phenylpropyldimethylsiloxysilicate, Polyamide-3, Polyamide-8, Polyester-10, Polyester-7, Polyethylene, Polymethylsilsesquioxane, Polyurethane-1, Polyurethane-14 (and) AMP-

Acrylates Copolymer, Polyurethane-18, Polyurethane-34, Polyurethane-35, Polyurethane-48, Polyurethane-64, Polyurethane-93, Polyvinyl Stearyl Ether, PPG-17/IPDI/DMPA Copolymer, PPG-26/Dimer Dilinoleate Copolymer, Pullulan, PVP, PVP CROSSPOLYMER, Sodium Polyacrylate, Sodium Polystyrene Sulfonate, Styrene/Acrylates Copolymer, Styrene/VP Copolymer, Triacontanyl PVP, Trifluoropropyldimethylsiloxy/Trimethylsiloxy Silsesquioxane, Trimethylpentanediol/Adipic Acid/Glycerin Crosspolymer, Trimethylsiloxysilicate, VA/Butyl, Maleate/Isobornyl Acrylate Copolymer, VA/Crotonates Copolymer, VA/Crotonates/Vinyl Neodecanoate Copolymer, Vinyl Caprolactam/VP/Dimethylaminoethyl Methacrylate Copolymer, VP/HEXADECENE COPOLYMER, VP/Acrylates/Lauryl Methacrylate Copolymer, VP/Dimethylaminoethylmethacrylate Copolymer, VP/DMAPA Acrylates Copolymer, VP/Eicosene Copolymer, VP/Hexadecene Copolymer, VP/Methacrylamide/Vinyl Imidazole Copolymer, VP/VA Copolymer, VP/Vinyl Caprolactam/DMAPA Acrylates Copolymer, copolymers thereof, or mixtures thereof. In specific aspects, the film former can include sodium polyacrylate.

**[0015]** The extract can be in a range of from about 0.10 wt% to about 5 wt% of the active component, about 0.5 wt% to about 1.5 wt% of the active component, less than, equal to, or greater than about 0.5 wt%, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4, or about 1.5 wt%. In addition to the *nymphaea coerulea* flower extract and *nelumbo nucifera* flower extract, the extract solution can include additional components. Those additional components can include propanediol and glycerin. In some examples, the *nymphaea coerulea* flower extract is in a range of from about 0.00075 wt% to about 0.04 wt%, 0.001 wt% to about 0.02 wt% of the extract, 0.001 wt% to about 0.01 wt% of the extract, about 0.005 wt% to about 0.009 wt%, less than equal to, or greater than about 0.001 wt%, 0.005, 0.009, or 0.01 wt%. The *nelumbo nucifera* flower extract can be in a range of from about 0.00075 wt% to 0.04 wt%, about 0.001 wt% to 0.02 wt% of the extract, 0.001 wt% to about 0.01 wt% of the extract, about 0.005 wt% to about 0.009 wt%, less than equal to, or greater than about 0.001 wt%, 0.005, 0.009, or 0.01 wt%. The propanediol can be in a range of from about 0.08 wt% to about 4 wt%, about 0.1 to 1.6 wt%, 0.5 to about 1.5 wt% of the extract, about 0.6 wt% to about 1 wt%, less than, equal to, or greater than about 0.5 wt%, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4, or about 1.5 wt%. The glycerin can be in a range of from about 0.01 wt% to about 1 wt%, about 0.03 wt% to 0.4 wt% of the extract, 0.05 wt% to about 0.2 wt% of the extract, about 0.07 wt% to about 0.1 wt%, less than, equal to, or greater than about 0.05 wt%, 0.06, 0.07, 0.08, 0.09, 0.1, or about 0.2 wt%.

[0016] The antiperspirant composition can include a solvent. The solvent can be an organic solvent. Where present, the solvent is in a range of from about 1 wt% to 50 wt% or 10 wt% to about 50 wt% of the active component, about 30 wt% to about 40 wt% of the active component, less than, equal to, or greater than about 30 wt%, 31, 32, 33, 34, 35, 36, 5 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, or about 50 wt% of the antiperspirant composition. Examples of organic solvents can include an isododecane component, an alkyl benzoate component, and a neopentyl glycol diheptanoate component. Isododecane (an example of which is represented by CAS 31807-55-3) is generally understood to be a clear, colorless and odorless, volatile liquid, which makes it suitable for use in color cosmetics like 10 mascara, eyeliner, lip products, antiperspirant or any product where improved wear properties and no residues are wanted. It does not leave an oily residue. Isododecane is a volatile, lipophilic component for deodorant sprays and hair care applications. It is a hydrocarbon ingredient used as a solvent. The alkyl benzoate component can be C12-15 alkyl benzoate (an example of which is represented by CAS 68411-27-8), which is generally understood to be a 15 low-molecular weight ester of benzoic acid and C12-15 alcohols. C12-15 alkyl benzoate is a clear liquid that is practically odorless. In some examples, the alkyl benzoate component includes a C12 alkyl benzoate, a C13 alkyl benzoate, a C14 alkyl benzoate, a C15 alkyl benzoate, or a mixture thereof. Neopentyl glycol diheptanoate (an example of which is represented by CAS 68855-18-5) is generally understood to be a mixture of texture- 20 enhancing ingredient neopentyl glycol and grape-derived fatty acid heptanoic acid.

[0017] According to various aspects of the present disclosure, the antiperspirant composition can include cyclopentasiloxane as a solvent. However, in some aspects, the antiperspirant composition is substantially free of cyclopentasiloxane. For example, the antiperspirant can include less than about 10 wt% cyclopentasiloxane, less than about 9 wt%, 25 less than about 8 wt%, less than about 7 wt%, less than about 6 wt%, less than about 5 wt%, less than about 4 wt%, less than about 3 wt%, less than about 2 wt%, less than about 1 wt%, less than about 0.5 wt%, less than about 0.1 wt%, less than about 0.01 wt%, or less than about 0.001 wt%. in some aspects, the composition is completely free (e.g., includes 0 wt%) of cyclopentasiloxane. The disclosed isododecane component, alkyl benzoate component, and 30 neopentyl glycol diheptanoate component, together, function to effectively replace cyclopentasiloxane in an antiperspirant while yielding an antiperspirant having similar, equal, or superior performance. Replacing cyclopentasiloxane can be desirable because, despite its performance in antiperspirant compositions, regulatory schemes seek to limit cyclopentasiloxane's use in cosmetic products. Therefore, it is important to find an effective

substitute for cyclopentasiloxane. The inventors found that the combination of the isododecane component, alkyl benzoate component, and neopentyl glycol diheptanoate component, unexpectedly, provide an adequate replacement for cyclopentasiloxane. For example, an intensity or quantity at least one of spray discharge, amount of residue build-up in an underarm, amount of residue staining of clothing, perceived stickiness, antiperspirant protection, anti-odor protection, softness perception, or a combination thereof of the antiperspirant composition is substantially equal to that of the comparative antiperspirant composition including cyclopentasiloxane.

**[0018]** The antiperspirant composition can include any number of additional components. For example, the antiperspirant composition can include a perfume. The perfume can be in a range of from about 0.001 wt% to 8 wt% of the antiperspirant composition, 0.001 wt% to about 5 wt% of the antiperspirant composition, about 0.01 wt% to about 0.05 wt%, less than, equal to, or greater than about 0.001 wt%, 0.005, 0.01, 0.05, 0.1, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, or about 5 wt%. Perfumes or perfume raw materials can include compounds having a thiol moiety can include 5-methyl-5-sulfanylhexan-3-one; 2-(4-methyl-1-cyclohex-3-enyl)propane-2-thiol; 5-methyl-2-(2-sulfanylpropan-2-yl)cyclohexan-1-one; 4,7,7-trimethyl-6-thiabicyclo[3.2.1]octane; 4-methoxy-2-methylbutane-2-thiol; methanethiol; ethanethiol; prop-2-ene-1-thiol; propane-2-thiol; 2-methylpropane-2-thiol; propane-1-thiol; butane-2-thiol; butane-1-thiol; 2-methylpropane-1-thiol; methyldisulfanylmethane; 2-methylbutane-2-thiol; 3-methylbutane-2-thiol; 3-methylbutane-2-thiol; pentane-2-thiol; pentane-1-thiol; 2-methylbutane-1-thiol; cyclopentanethiol; 3-methyldisulfanylprop-1-ene; methylsulfanyldisulfanylmethane; 1-methyldisulfanylpropane; ethane-1,2-dithiol; 1-(methyldisulfanyl)prop-1-ene; 3-sulfanylbutan-2-one; ethyldisulfanylethane; hexane-1-thiol; 1-ethyldisulfanylpropane; thiophene-2-thiol; propane-1,3-dithiol; 3-sulfanylpentan-2-one; 2-propan-2-yldisulfanylpropane; butane-1,4-dithiol; benzenethiol; ethylsulfanyldisulfanylethane; 3-methylsulfanyldisulfanylprop-1-ene; 1-methylsulfanyldisulfanylpropane; butane-2,3-dithiol; 4-methyl-4-sulfanylpentan-2-one; 3-prop-2-enyldisulfanylprop-1-ene; 1-methoxyhexane-3-thiol; ethyl 2-sulfanylpropanoate; 1-(prop-2-enyldisulfanyl)propane; 1-propyldisulfanylpropane; 1-(4-hydroxy-3-methoxyphenyl)ethanone butane-1,3-dithiol; 1-propyldisulfanylprop-1-ene; 2-methylbenzenethiol; thiophen-2-ylmethanethiol; 3-sulfanylbutan-2-ol; phenylmethanethiol pentane-1,5-dithiol; 2-ethylbenzenethiol; 3-prop-2-enylsulfanyldisulfanylprop-1-ene; methylsulfanyldisulfanylmethane; 1-propylsulfanyldisulfanylpropane; 2,7,7-trimethylbicyclo[3.1.1]heptane-2-thiol; 2,6-dimethylbenzenethiol; 2-phenylethanethiol;



hexane-1,6-dithiol; 2-(methyldisulfanylmethyl)furan; pyridin-2-ylmethanethiol; 2-methoxybenzenethiol; (7,7-dimethyl-2-bicyclo[3.1.1]heptanyl)methanethiol; methyldisulfanylbenzene; 1-butylsulfanylbutane; (4-methoxyphenyl)methanethiol; 2-sulfanylpropanoic acid; ethyl 2-methyldisulfanylpropanoate; (2E)-3,7-dimethylocta-2,6-diene-1-thiol; 3,7-dimethylocta-2,6-diene-1-thiol; pyrazin-2-ylmethanethiol; 5 methyldisulfanylmethylbenzene; 2-methyl-5-(1-sulfanylpropan-2-yl)cyclohexane-1-thiol; octane-1,8-dithiol; 2-pyrazin-2-ylethanethiol; naphthalene-2-thiol; 2-oxo-3-sulfanylpropanoic acid; 2-thiophen-2-ylsulfanylthiophene; cyclohexyldisulfanylcyclohexane; 2-(furan-2-ylmethyldisulfanylmethyl)furan; phenyldisulfanylbenzene; benzylsulfanylmethylbenzene; 10 8-Hydroxy-5-quinolinesulfonic acid; bis(3-methylbutyl) 2-sulfanylbutanedioate; 2-aminoethanesulfonic acid; 2-phenyl-3H-benzimidazole-5-sulfonic acid; and 2-methyl-2-sulfanylpentan-1-ol. The compounds comprising sulfide moiety is selected from the group consisting of 1-butylsulfanylbutane; 2-methylsulfanylpyrazine; 2-methyl-3-methylsulfanylpyrazine; 2-(methylsulfanylmethyl)pyrazine; and mixtures thereof. Non- 15 limiting examples of compounds having a thiazole moiety can include 2-(2-methylpropyl)-1,3-thiazole; 2-(4-methyl-1,3-thiazol-5-yl)ethanol; 4-methyl-2-propan-2-yl-1,3-thiazole; 1-(1,3-thiazol-2-yl)ethanone; 2,4,5-Trimethylthiazole; 2-isopropyl-4-methylthiazole; 4-vinyl-5-methylthiazole; 2,4-Dimethyl-5-acetylthiazole 1,3-thiazole; 4-methyl-1,3-thiazole; 2,4-dimethyl-1,3-thiazole; 4,5-dimethyl-1,3-thiazole; 2,5-dimethyl-1,3-thiazole; 5-ethenyl-4- 20 methyl-1,3-thiazole; 2-ethyl-4-methyl-1,3-thiazole; 4-ethyl-2-methyl-1,3-thiazole; 2-propyl-1,3-thiazole; 2,4,5-trimethyl-1,3-thiazole; 2-ethyl-1,3-thiazole; 2-ethoxy-1,3-thiazole; 2-butan-2-yl-1,3-thiazole; 5-methoxy-2-methyl-1,3-thiazole; 2-ethyl-4,5-dimethyl-1,3-thiazole; 1,3-benzothiazole; 2,5-diethyl-4-methyl-1,3-thiazole; 1-(1,3-thiazol-2-yl)propan-1-one; 4,5-dimethyl-2-(2-methylpropyl)-1,3-thiazole; 2-methyl-1,3-benzothiazole; 1-(2,4-dimethyl-1,3- 25 thiazol-5-yl)ethanone; and 4-methyl-2-propan-2-yl-1,3-thiazole.

**[0019]** Non-limiting examples of further perfumes include compounds having an oxathiane moiety, which can include (2R,4S)-2-methyl-4-propyl-1,3-oxathiane, 2-methyl-4-propyl-1,3-oxathiane, and 2-pentyl-4-propyl-1,3-oxathiane.

**[0020]** Non-limiting examples of further perfumes include compounds containing 30 oxygen, sulfur, and nitrogen include 2-(4-methyl-1,3-thiazol-5-yl)ethanol; 1-(1,3-thiazol-2-yl)ethanone; 6-methyl-7-Oxa-1-thia-4-azaspiro[4.4]nonane; 2- [(furan-2-ylmethyl)sulfanyl] -5 -methylpyrazine; 2,4-Dimethyl-5-acetylthiazole; 2-ethoxy-1,3-thiazole; 5-methoxy-2-methyl-1,3-thiazole; 1-(4,5-dihydro-1,3-thiazol-2-yl)ethanone; 1-(1,3-thiazol-2-yl)propan-1-one; 1-(2,4-dimethyl-1,3-thiazol-5-yl)ethanone; 2-amino-4-methylsulfanylbutanoic acid;

(2S)-2-amino-4-methylsulfanylbutanoic acid; 8-Hydroxy-5-quinolinesulfonic acid; 2-aminoethanesulfonic acid; 2-phenyl-3H-benzimidazole-5-sulfonic acid.

**[0021]** More specific examples of the thiol moiety can include a-methyl-5-sulfanylhexan-3-one; 2-(4-methyl-1-cyclohex-3-enyl)propane-2-thiol; 5-methyl-2-(2-sulfanylpropan-2-yl)cyclohexan-1-one; 4,7,7-trimethyl-6-thiabicyclo[3.2.1]octane; and 4-methoxy-2-methylbutane-2-thiol.

**[0022]** More specific examples of the sulfide moiety can include 1-butylsulfanylbutane; ethyl 3-methylsulfanylpropanoate; and 2-(methylsulfanylmethyl)furan.

**[0023]** More specific examples of compounds having a thiazole moiety can include 2-(2-methylpropyl)-1,3-thiazole; 2-(4-methyl-1,3-thiazol-5-yl)ethanol; 4-methyl-2-propan-2-yl-1,3-thiazole; 4-methyl-2-propan-2-yl-1,3-thiazole; and 1-(1,3-thiazol-2-yl)ethanone.

**[0024]** A more specific example of compounds having an oxathiane moiety can be (2R,4S)-2-methyl-4-propyl-1,3-oxathiane.

**[0025]** More specific examples of a compound comprising oxygen, sulfur, and nitrogen can include 2-(4-methyl-1,3-thiazol-5-yl)ethanol, 1-(1,3-thiazol-2-yl)ethanone; and 6-methyl-7-Oxa-1-thia-4-azaspiro[4.4]nonane.

**[0026]** In another example, the perfume raw materials can include sulfide moieties or thiazole moieties. The sulfide moieties can include 1-butylsulfanylbutane, 4,7,7-trimethyl-6-thiabicyclo[3.2.1]octane, and 2-methyl-3-methylsulfanylpyrazine. The thiazole moieties can include 1-(1,3-thiazol-2-yl)ethanone.

**[0027]** In another example, the perfume raw materials can be added to a base perfume in a group. Suitable groups can include group (a): 1-butylsulfanylbutane; (2R, 4S)-2-methyl-4-propyl-1,3-oxathiane; and 4-methoxy-2-methylbutane-2-thiol; group (b): 2-(4-methyl-1,3-thiazol-5-yl)ethanol; 7-Oxa-1-thia-4-azaspiro[4.4]nonane; and 6-methyl-, 1-(1,3-thiazol-2-yl)ethanone; group (c): 2-(methylsulfanylmethyl)furan; ethyl 3-methylsulfanylpropanoate; and 1-butylsulfanylbutane; group (d): 5-methyl-5-sulfanylhexan-3-one; 5-methyl-2-(2-sulfanylpropan-2-yl)cyclohexan-1-one; and 2-(4-methyl-1-cyclohex-3-enyl)propane-2-thiol; group (e): 2-(2-methylpropyl)-1,3-thiazole; 2-(4-methyl-1,3-thiazol-5-yl)ethanol; and 4-methyl-2-propan-2-yl-1,3-thiazole; and group (f): (2R,4S)-2-methyl-4-propyl-1,3-oxathiane; 2-(4-methyl-1-cyclohex-3-enyl)propane-2-thiol; and (NE)-N-[(6E)-2,4,4,7-tetramethylnona-6,8-dien-3-ylidene]hydroxylamine

**[0028]** Suitable perfume raw materials may be obtained from: Symrise GmbH, with offices located at Muhlenfeldstrasse 1, Holzminden, 37603, Germany; International Flavors & Fragrances Inc., a New York corporation having an address at 521 W 57th Street, New

York, NY 10019; Givaudan Suisse SA a Swiss corporation having an address at 1214 Vernier, Switzerland; Firmenich Inc., with offices located at 250 Plainsboro Rd., Plainsboro Township, NJ 08536, United States; and Takasago International Corporation (USA), with offices located at 4 Volvo Drive, Rockleigh, NJ 07647, United States.

5 **[0029]** Antiperspirants compositions can also incorporate desirable scents through inclusion of perfumes and perfume raw materials in perfume delivery systems. Certain perfume delivery systems, methods of making certain perfume delivery systems, and the uses of such perfume delivery systems are disclosed in U.S. Pre-Grant Publication No. 2007/0275866 A1 . The perfumes and perfume raw materials previously disclosed can be  
10 used in such perfume delivery systems. Such perfume delivery systems include: polymer-assisted delivery (PAD), molecule-assisted delivery (MAD), fiber-assisted deliver (FAD), amine-assisted delivery (AAD), cyclodextrin delivery system (CD), starch encapsulated accord (SEA), inorganic carrier delivery system (ZIC), and Pro-Perfume (PP). Examples of these perfume delivery systems are further described below.

15 **[0030]** In some aspects, the antiperspirant composition can include an odor entrapper. Where present, the odor entrapper is present in a range of from about 0.01 wt% to about 5 wt% of the antiperspirant composition, about 0.02 wt% to about 4 wt%, less than, equal to, or greater than about 0.01 wt%, 0.02, 0.05, 0.1, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, or about 5 wt%.

**[0031]** Examples of suitable odor entrappers include, for example, solubilized, water-  
20 soluble, uncomplexed cyclodextrin. As used herein, the term “cyclodextrin” includes any of the known cyclodextrins such as unsubstituted cyclodextrins containing from six to twelve glucose units, especially, alpha-cyclodextrin, beta-cyclodextrin, gamma-cyclodextrin and/or their derivatives and/or mixtures thereof. The alpha-cyclodextrin includes six glucose units, the beta-cyclodextrin includes seven glucose units, and the gamma-cyclodextrin consists of  
25 eight glucose units arranged in a donut-shaped ring. The specific coupling and conformation of the glucose units give the cyclodextrins a rigid, conical molecular structure with a hollow interior of a specific volume. Cyclodextrin molecules are described in U.S. Patent No. 5,714,137 , and U.S. Patent No. 5,942,217. Suitable levels of cyclodextrin are from about 0.1% to about 5%, alternatively from about 0.2% to about 4%, alternatively from about 0.3%  
30 to about 3%, alternatively from about 0.4% to about 2%, by weight of the composition.

**[0032]** In some aspects, the antiperspirant composition can further include a buffering agent. Where present, the buffering agent can be in a range of from about 0.001 wt% to about 0.75 wt% of the antiperspirant composition, about 0.01 wt% to about 0.5 wt%, less than, equal to, or greater than about 0.001 wt%, 0.005, 0.01, 0.05, 0.1, 0.5, or about 0.75 wt%.

**[0033]** A buffering agent can be alkaline, acidic or neutral. The buffer can be used in the composition for maintaining the desired pH. The composition may have a pH from about 3 to about 10, from about 4 to about 9, from about 5 to about 8, from about 6 to about 7, or it may have a pH of about 6.5. One unique feature of the polyvinyl amine malodor control  
5 polymers is its ability to maintain active nitrogen sites at high pH levels which can help enhance the antibacterial effect which comes, at least in part, from the nitrogen sites. Suitable buffering agents include, for example, hydrochloric acid, sodium hydroxide, potassium hydroxide, and combinations thereof.

**[0034]** In some aspects of the present disclosure, the antiperspirant composition can include a preservative. Where present, the preservative can be a range of from about 0.0001  
10 wt% to about 1 wt%, about 0.0001 wt% to about 0.5 wt% of the antiperspirant composition, about 0.0003 wt% to about 0.1 wt%, less than, equal to, or greater than about 0.0001 wt%, 0.0003, 0.0005, 0.001, 0.005, 0.01, 0.05, 0.1, or about 0.5.

**[0035]** When included, the preservative is included in an amount sufficient to prevent  
15 spoilage or prevent growth of inadvertently added microorganisms for a specific period of time, but not sufficient enough to contribute to the odor neutralizing performance of the composition. In other words, the preservative is not being used as the antimicrobial compound to kill microorganisms on the surface onto which the composition is deposited in order to eliminate odors produced by microorganisms. Instead, it is being used to prevent  
20 spoilage of the composition in order to increase shelf-life.

**[0036]** The preservative can be any organic preservative material which will not cause damage to fabric appearance, e.g., discoloration, coloration, bleaching. Suitable water-soluble preservatives include organic sulfur compounds, halogenated compounds, cyclic  
25 organic nitrogen compounds, low molecular weight aldehydes, parabens, propane diol materials, isothiazolinones, quaternary compounds, benzoates, low molecular weight alcohols, dehydroacetic acid, phenyl and phenoxy compounds, or mixtures thereof.

**[0037]** Non-limiting examples of commercially available water-soluble preservatives include a mixture of about 77% 5-chloro-2-methyl-4-isothiazolin-3-one and about 23% 2-methyl-4-isothiazolin-3-one, a broad spectrum preservative available as a 1.5% aqueous  
30 solution under the trade name Kathon® CG by Rohm and Haas Co.; 5-bromo-5-nitro-1,3-dioxane, available under the tradename Bronidox L® from Henkel; 2-bromo-2-nitropropane-1,3-diol, available under the trade name Bronopol® from Inolex; 1,1'-hexamethylene bis(5-(p-chlorophenyl)biguanide), commonly known as chlorhexidine, and its salts, e.g., with acetic and digluconic acids; a 95:5 mixture of 1,3-bis(hydroxymethyl)-5,5-dimethyl-2,4-

imidazolidinedione and 3-butyl-2-iodopropynyl carbamate, available under the trade name Glydant Plus® from Lonza; N-[1,3-bis(hydroxymethyl)2,5-dioxo-4-imidazolidinyl]-N,N'-bis(hydroxy-methyl) urea, commonly known as diazolidinyl urea, available under the trade name Germall® II from Sutton Laboratories, Inc.; N,N''-methylenebis {N'-[1-(hydroxymethyl)-2,5-dioxo-4-imidazolidinyl]urea}, commonly known as imidazolidinyl urea, available, e.g., under the trade name Abiol® from 3V-Sigma, Unicide U-13® from Induchem, Germall 115® from Sutton Laboratories, Inc.; polymethoxy bicyclic oxazolidine, available under the trade name Nuosept® C from Hüls America; formaldehyde; glutaraldehyde; polyaminopropyl biguanide, available under the trade name Cosmocil CQ® from ICI Americas, Inc., or under the trade name Mikrokill® from Brooks, Inc; dehydroacetic acid; and benzisothiazolinone available under the trade name Koralone™ B-119 from Rohm and Hass Corporation.

**[0038]** The antiperspirant composition can further include an inactive component. The inactive component can be in a range of from about 50 wt% to about 90 wt% of the antiperspirant composition, about 75 wt% to about 85 wt% of the antiperspirant composition, less than, equal to, or greater than about 50 wt%, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, or about 90 wt%. when the inactive component is present, the active component is in a range of from about 10 wt% to about 50 wt% of the composition, about 15 wt% to about 25 wt% of the composition, less than, equal to, or greater than about 10 wt%, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, or about 50 wt% of the antiperspirant composition.

**[0039]** The concentration of the inactive component relative to the active component can impact the antiperspirant's performance. For example, if the inactive component concentration is too large, less perspiration may be blocked or prevented. Additionally, if the antiperspirant composition is an aerosol spray, too much inactive component can lead to blockage of the spray device that the antiperspirant composition is disposed in.

**[0040]** The inactive component can include a propellant. The propellant can be in a range of from about 15 wt% to about 100 wt% of the inactive component, about 80 wt% to about 95 wt% of the active component, less than, equal to, or greater than about 15 wt%, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, or about 100 wt% of the inactive component. Examples of suitable propellants include compressed air, nitrogen, inert gases, carbon dioxide, and mixtures thereof. Propellants may also include gaseous hydrocarbons like propane, n-butane, isobutene, cyclopropane, and mixtures thereof. Halogenated

hydrocarbons like 1,1-difluoroethane may also be used as propellants. Some non-limiting examples of propellants include 1,1,1,2,2-pentafluoroethane, 1,1,1,2-tetrafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane, trans-1,3,3,3-tetrafluoroprop-1-ene, dimethyl ether, dichlorodifluoromethane (propellant 12), 1,1-dichloro-1,1,2,2-tetrafluoroethane (propellant 114), 1-chloro-1,1-difluoro-2,2-trifluoroethane (propellant 115), 1-chloro-1,1-difluoroethylene (propellant 142B), 1,1-difluoroethane (propellant 152A), monochlorodifluoromethane, and mixtures thereof. Some other propellants suitable for use include, but are not limited to, A-46 (a mixture of isobutane, butane and propane), A-31 (isobutane), A-17 (n-butane), A-108 (propane), AP70 (a mixture of propane, isobutane and n-butane), AP40 (a mixture of propane, isobutene and n-butane), AP30 (a mixture of propane, isobutane and n-butane), and 152A (1,1 difluoroethane).

**[0041]** In some examples, the inactive component can include a suspending agent. The suspending agent can be in a range of from about 0.1 wt% to about 5 wt% of the inactive component, about 0.1 wt% to about 2 wt% of the inactive component, less than, equal to, or greater than about 0.1 wt%, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, or about 5 wt%. Where present, the suspending agent can include tearalkonium hectorite, which is designed to impart rheological control and suspension and is a suitable thickener for compositions of the present disclosure. It is a highly efficient rheological additive for intermediate to high polarity systems such as cyclomethicones, esters, triglycerides, vegetable oils, alcohols and ketones.

**[0042]** According to various aspects, of the present disclosure the antiperspirant composition can include an antiperspirant concentrate. In some aspects, alcohol is a predominant component of the concentrates provided herein. Useful alcohols include C<sub>1</sub>-C<sub>3</sub> alcohols, with the preferred alcohol being ethanol. In certain examples, the alcohol is employed at a concentration level of from at least about 40%, 50% or 55% to about 80%, by weight of the inactive component.

**[0043]** According to various embodiments of the present disclosure, the antiperspirant composition can be a component of an assembly. For example, if the antiperspirant composition is an aerosol spray, the assembly can include a spray container and the antiperspirant composition. In some further examples, if the antiperspirant composition is a stick, the assembly can include a container with the antiperspirant composition disposed therein.

## Examples

**[0044]** Various embodiments of the present disclosure can be better understood by reference to the following Examples which are offered by way of illustration. The present disclosure is not limited to the Examples given herein.

**[0045]** The synergistic effect of including an aluminum salt (aluminum sesquichlorohydrate) or magnesium salt (magnesium carbonate); an extract (propanediol, glycerine, nymphaea coerulea flower extract, and nelumbo nucifera flower extract); and a film former (sodium polyacrylate) is shown in the examples below. Table 1 shows formula 1, which includes the aluminium salt, film former, and extract. Table 2 shows comparative formula 1, which does not include the extract or film former. Table 3 shows comparative formula 2, which does not include the extract.

Table 1: Formula 1

Ingredient	Wt% of total antiperspirant composition
Aluminium Sesquichlorohydrate	5-10
C12-15 Alkyl Benzoate	1-5
Isododecane	1-5
Diisopropyl Adipate	0.5-2
Neopentyl Glycol Diheptanoate	0.5-3
Disteardimonium Hectorite	0.5-3
Propylene Carbonate	0.1-1
Sodium Polyacrylate	0.5-2
Aqua	0.05-0.3
Propanediol	0.05-0.20
Glycerine	0.01-0.05
Nymphaea Coerulea Flower Extract	0.0005-0.009
Nelumbo Nucifera Flower Extract	0.0005-0.009
Butane	50-60
Propane	10-20
Isobutane	5-15

Table 2: Comparative Formula 1

Ingredient	Wt% of total antiperspirant composition
Aluminium Sesquichlorohydrate	5-10
C12-15 Alkyl Benzoate	3-8
Isododecane	1-5
Diisopropyl Adipate	1-5
Neopentyl Glycol Diheptanoate	0.5-2
Disteardimonium Hectorite	0.3-0.8
Propylene Carbonate	0.10-0.5
Butyl Hydroxytoluene (BHT)	0.005-0.01
Butane	50-60
Propane	10-20
Isobutane	5-15

Table 3: Comparative Formula 2

INCI	%
Aluminium Sesquichlorohydrate	3-12
C12-15 Alkyl Benzoate	1-5
Isododecane	1-5
Diisopropyl Adipate	0.5-2
Neopentyl Glycol Diheptanoate	0.5-2
Disteardimonium Hectorite	0.3-0.9
Propylene Carbonate	1-5
Butyl Hydroxytoluene (BHT)	0.01-0.8
Sodium Polyacrylate	0.5-3
Aqua	0.1-0.5
glycerine	0.05-1.5
Humulus Lupulus Extract	0.0001-0.0007
Rosmarinus Officinalis Leaf Extract	0.0001-0.0007
Hamamelis Virginiana Leaf Extract	0.0001-0.0007



Salvia Officinalis Leaf Extract	0.0001-0.0007
Equisetum Arvense Extract	0.0001-0.0007
Citrus Limon Peel Extract	0.0001-0.0007
Centella Asiatica Extract	0.0001-0.0007
Pinus Sylvestris Bud Extract	0.0001-0.0007
Sodium Benzoate	0.0001-0.0007
Potassium Sorbate	0.0001-0.0007
Butane	50-60
Propane	10-20
Isobutane	5-15

Table 4: Formula 2

INCI Name	Wt%
Butane	50-65
Propane	11-19
Isobutane	7-11
C12-15 alkyl benzoate	7-11
Isododecane	1-4
Magnesium Carbonate	0.5-1.5
Diisopropyl Adipate	0.5-1
Neopentyl Glycol Diheptanoate	0.2-0.9
Disteardimonium Hectorite	0.2-0.6
Propylene Carbonate	0.05-0.2
Sweat Reduction of at least 20% in subjects after 12 hours, 24 hours, and 48 hours	59.09%

Table 5: Formula 3

INCI Name	Wt%
Butane	50-65
Propane	11-19
Isobutane	7-11
C12-15 alkyl benzoate	7-11

Isododecane	1-4
Magnesium Carbonate	0.5-1.5
Diisopropyl Adipate	0.5-1
Neopentyl Glycol Diheptanoate	0.2-0.9
Disteardimonium Hectorite	0.2-0.6
Propylene Carbonate	0.05-0.2
Propanediol	0.10-0.20
Glycerin	0.01-0.05
Nymphaea Coerulea Flower Extract	0.0005-0.003
Nelumbo Nucifera Flower Extract	0.0005-0.003
Sweat Reduction of at least 20% in subjects after 12 hours, 24 hours, and 48 hours	81.82%

Table 6: Formula 4

INCI Name	Wt%
Butane	40-60
Aqua	15-25
Propane	10-15
Isobutane	5-10
Isododecane	2-7
Neopentyl Glycol Diheptanoate	0.5-3
Dimethicone	0.2-0.9
PEG/PPG-18/18 Dimethicone	0.05-0.3
Propanediol	0.05-0.2
Sodium Benzoate	0.05-0.2
Triethyl Citrate	0.05-0.2
Caprylyl Glycol	0.05-0.2
Ethylhexylglycerin	0.05-0.2
Glycerin	0.05-0.2
Nymphaea Coerulea Flower Extract	0.0005-0.002
Nelumbo Nucifera Flower Extract	0.0005-0.002

Sweat Reduction of at least 20% in subjects after 12 hours, 24 hours, and 48 hours	81.82%
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Table 7: Stick Formula 5

INCI Name	Wt%
Propylene Glycol	70-80
Butylene Glycol	5-15
Sodium Stearate	3-9
Glycerin	3-8
Isosteareth-20	1-3
Magnesium Salt	0.5-1.5
Steareth-2	0.3-0.9
Ethylhexylglycerin	0.1-0.5
Propanediol	0.05-0.20
Water	0.001-0.009
Nymphaea Coerulea Flower Extract	0.0005-0.005
Nelumbo Nucifera Flower Extract	0.0005-0.005
Tocopherol	0.00001-0.00030
Sodium Hyaluronate	0.00005-0.0006

Table 8: Roll-on Formula 6

5

INCI	Wt %
Water	70-90
Helianthus Annuus (Sunflower) Seed Oil	3-6
Glycerin	3-6
Steareth-2	1-58
Cetearyl Alcohol	1-5
Triethyl Citrate	0.5-4
Xanthan Gum	0.5-4
Steareth-20	0.5-1.5
Ethylhexylglycerin	0.1-1
Sodium Benzoate	0.1-1
Chlorphenesin	0.1-0.3

Propanediol	0.1-0.3
Disodium EDTA	0.05-2
Tocopherol	0.001-0.005
Nymphaea Coerulea Flower Extract	0.0005-0.003
Nelumbo Nucifera Flower Extract	0.0005-0.003
Vegetable Oil	0.0005-0.003
Sodium Hyaluronate	0.00005-0.0006

Table 9: Roll-on Formula 7

INCI	%
Water	60-80
Helianthus Annuus (Sunflower) Seed Oil	2-6
Glycerin	2-6
Steareth-2	1-5
Cetearyl Alcohol	0.5-5
Triethyl Citrate	0.5-3
Magnesium Salt	0.5-3
Xanthan Gum	0.5-0.9
Steareth-20	0.5-1.5
Ethylhexylglycerin	0.3-1
Sodium Benzoate	0.3-1
Chlorphenesin	0.1-5
Propanediol	0.05-3
Disodium EDTA	0.05-2.5
Tocopherol	0.0005-0.004
Nymphaea Coerulea Flower Extract	0.0005-0.005
Nelumbo Nucifera Flower Extract	0.0005-0.005
Vegetable Oil	0.0005-0.003
Sodium Hyaluronate	0.00005-0.0005

5 Table 10: Stick Formula 8

INCI	%
Propylene glycol	60-80

Butylne glycol	5-15
Sodium stearate	3-8
Glycerin	3-8
Isosteareth-20	1-4
Steareth-2	0.2-0.6
Ethylhexylglycerin	0.1-0.3
Propanediol	0.05-0.15
Water	0.001-0.008
Nymphaea Coerulea Flower Extract	0.0005-0.005
Nelumbo Nucifera Flower Extract	0.0005-0.005
Vegetable Oil	0.0005-0.003
Sodium Hyaluronate	0.00005-0.0005

[0046] To study the amount of perspiration prevention provided by formulas 1-4 and comparative formulas 1 and 2, study subjects were assessed by a dermatologist at the start of the study in order to verify the inclusion and non-inclusion criteria. If included, the subjects received the products to be used during the wash-out period, and the instructions to be followed during this period. The wash-out period lasted  $21 \pm 4$  days. After the washout period, subjects returned to the Institute. Subjects were exposed to heat (hot room sitting) for 80 minutes (Baseline). The temperature was  $37.8^{\circ}\text{C} \pm 1^{\circ}\text{C}$  and relative humidity between 30% and 40%. The subjects approved washed their armpits and the investigational product was applied. These procedures were repeated for three days, in which one product application was performed by day for three consecutive days. At this time-point, subjects received T-shirts for using during these three days. Ninety-six hours (after the third application of the investigational product (96h)), the subjects also undergone exposure to heat (Hot Room sitting) for perspiration collection evaluation under the same condition of Baseline.

[0047] In another example the ability of the antiperspirant of formula 1 was assessed for its ability to reduce sweat by 3X for a time of 96 hours. The results of formula 1 were compared to an untreated armpit, which was considered to be a control. The test was conducted in accordance with the protocol laid out in 21 CFR 350.60 of the final rule for OTC antiperspirant drug products, published in the Federal Register on June 9, 2003 (68 FR 34273).

[0048] The methodology consisted of suspending the use of any deodorant, ointment, cream or any other product in the armpits region for 21 days and sanitizing them only with neutral soap and a standard deodorant that was delivered by the researcher. After the

conditioning period, the armpits were cleaned with a cleaning agent (neutral soap) and the initial evaluation was carried out in the sauna to verify the amount of sweat produced by the armpit without the application of any products. For approval, it was necessary for the participant to produce at least 100mg of armpit sweating for two consecutive sessions (T1 and T2) of 20 minutes each. Subsequently, the armpits were again cleaned with a neutral soap for the application of the investigational product in one armpit, while the other armpit remained without the application of any products. Four applications of the investigational product were carried out. After the application of the investigational product, the research participant was instructed not to wet, wash or rub any product in the armpits. 96 hours after the last application of the investigational product, the participants were exposed to heat in a sauna.

#### *Conditioning Phase*

[0049] During the conditioning period, participants were instructed to suspend the use of any topical products in the armpits. Participants were instructed to clean their armpits only with the neutral soap and standard deodorant provided by the laboratory. The conditioning period was 21 days.

#### *Verification of aluminum residue*

[0050] Participants were instructed to remove their T-shirt and lie on the stretcher with their arms up.

[0051] The researcher passed cotton-tipped flexible rod across the entire armpit region and then stored it in a properly identified plastic cup. Then, using a disposable pipette, applied the aluminum accusing solution until the tip of the cotton is well watered. If there is aluminum, the added solution will change its color for pink or purple.

[0052] All participants were approved in the verification of aluminum residue.

#### *Underarm hygiene*

[0053] Participants were instructed and supervised by the researcher to wash their armpits before applying the investigational product.

[0054] The armpits were cleaned according to the following procedure, before the baseline sauna and the first application of the investigational product:

- Wash one of the armpits during the period of 20 seconds with a standard neutral soap;
- Rinse the armpit under running water until all the soap is completely removed;
- Dry the armpit with a disposable towel;
- 5 • Repeat the same procedure with the other armpit.

[0055] After cleaning the armpits, the participants received and wore a white tank top, 100% cotton, cleaned with water and mild soap.

[0056] The armpits were cleaned according to the following procedure, before other applications of the investigational product:

- 10 • Wash one armpit for 10 seconds with a disposable towel saturated with a standard 2% neutral soap solution;
- Wet a clean disposable towel in running water and rinse the armpit until all soap is completely removed;
- 15 • Gently dry the armpit with a disposable towel; Repeat the same procedure with the other armpit.

#### *Initial assessment of armpits sweating*

[0057] Research participants remained in the sauna with a temperature of  $37.8 \pm 2^\circ\text{C}$  and relative air humidity =  $35 \pm 5\%$ , for a total period of 80 minutes, including 40 minutes of heating.

20 [0058] To collect sweating were used of absorbents pads, stored in polyethylene containers closed.

[0059] The pads were placed in the armpits of the participants immediately after they entered the sauna being replaced every 20 minutes. Every 20 minutes of warm up period, the pads were removed and discarded. Then, new pre-weighed pad was placed, being replaced  
25 every 20 minutes. The pads relative to the times of 60 to 80 minutes of exposure were removed and weighed, corresponding respectively to T1 and T2.

[0060] The participants drank 200 ml of water before entering the hot room, and then a further 200 ml of water after spending 40 minutes in the hot room.

[0061] In the initial assessment the research participants must present at least 100 mg  
30 of sweating in each armpit for 20 minutes of heat exposure.

#### *Application of the investigational product*

[0062] The investigational product was applied for 3 seconds timed, at a distance of 15 cm in a defined armpit area of  $24 \text{ cm}^2$ .

[0063] The procedure for applying the investigational product was performed four times by the researcher. The investigational product was evenly distributed in the armpits until it completely covered the defined area.

5 [0064] After the applications, the participants remained in an air-conditioned place for 30 minutes until the film was completely dried and formed.

*Assessment of underarm sweat after the application of the investigational product*

[0065] 96 hours after the last application of the investigational product, the research participants were exposed to heat in the sauna.

10 [0066] The research participants remained in the sauna with a temperature of  $37.8 \pm 2$  ° C and relative humidity = 30 to 40%, for a total period of 80 minutes.

[0067] For the collection of sweating, absorbent pads were used, stored in closed polyethylene packages. The first pads were placed on the participants' armpits immediately after they entered the sauna and they were changed every 20 minutes. After 40 minutes of warm-up, the pads were removed and discarded.

15 [0068] Then, new previously weighed pads were placed, being replaced every 20 minutes. The pads for the 60 and 80-minute exposure times were removed and weighed, corresponding to the T3 and T4 times, respectively.

20 [0069] The participants ingested 200 ml of water when entering the sauna and 40 minutes after its beginning, in order to maintain the internal level of hydration, allowing a free flow of sweat and evidencing only the effects of the formulation of the tested product. The levels obtained during the first 40 minutes were disregarded. Participants left the sauna, hydrated and waited 5 minutes for restoring and adapting to the outside temperature.

[0070] Research participants who had less than 100mg of sweat in the control armpit during 20 minutes of exposure to heat were excluded from the study.

25 *Results obtained in the assessment*

*Initial assessment of armpit sweating*

[0071] According to the data obtained, 22 research participants were approved in the initial phase of the study, that is, all had a quantity of sweating equal to or greater than 100mg per armpit at each time, T1 and T2.

30 *Assessment of armpit sweating after application of the investigational product*



[0072] When in the study there are pre-treatment records (baseline) the ratio of the treated armpit to the control armpit adjusted to the ratio of the right-to-left armpit sweating rate is defined for each individual by the formula:

$$Z = (PC \times T) / (PT \times C)$$

5 [0073] Where: Z is the adjusted ratio, PC is the amount of sweat obtained in the pre-treatment for the control armpit, PT is the amount of sweat obtained in the pre-treatment for the armpit that will receive the treatment, T is the amount of sweat obtained for the armpit treated with the investigational product and C is the amount of sweat obtained for the control armpit.

10 [0074] The test showed that at least 50% of the survey participants showed a reduction in sweating of at least 60% after 96 hours for Formula 1. The advantageous performance of Formula 1 is demonstrated as well against Comparative Formula 1 and Comparative Formula 2. Specifically, Comparative Formula 1, lacked comparable performance and lacks the NELUPURE composition. Comparative Formula 2 is a more  
15 traditional antiperspirant composition that includes several extracts other than NELUPURE. Formulas 2-4 show that magnesium salts such as magnesium carbonate can be used in antiperspirant compositions and deliver adequate performance. Formula 2 shows that magnesium carbonate can be used in an antiperspirant composition that does not include NELUPURE. Formula 3 shows that magnesium carbonate can be used in an anhydrous  
20 composition, including NELUPURE, and deliver adequate performance. Formula 4 shows that magnesium carbonate can be used in an aqueous composition, including NELUPURE, and deliver adequate performance. Formulas 5-8 show that it is possible to incorporate NELUPURE along with an aluminum or magnesium salt into a roll-on or stick antiperspirant composition.

25

#### Additional Embodiments.

[0075] The following exemplary embodiments are provided, the numbering of which is not to be construed as designating levels of importance:

30 [0076] Aspect 1 provides an antiperspirant composition comprising:  
an active component comprising:  
an aluminum salt, magnesium salt or a mixture thereof;  
a film former; and

an extract solution comprising:  
 nymphaea coerulea flower extract; and  
 nelumbo nucifera flower extract.

- [0077]** Aspect 2 provides the antiperspirant composition of Aspect 1, wherein the  
 5 aluminum salt, magnesium salt or a mixture thereof is in a range of from about 1 wt% to  
 about 55 wt% of the active component.
- [0078]** Aspect 3 provides the antiperspirant composition of any one of Aspects 1 or 2,  
 wherein the aluminum salt, magnesium salt or a mixture thereof is in a range of from about  
 35 wt% to about 45 wt% of the active component.
- 10 **[0079]** Aspect 4 provides the antiperspirant composition of any one of Aspects 1-3,  
 wherein the aluminum salt comprises:  
 $Al_2(OH)_xQyXH_2O$ , wherein  
 Q is chlorine, bromine or iodine; x is from about 2 to about 5, and  $x+y$ =about 6, and  
 x and y do not need to be integers; and where X is from about 1 to about 6.
- 15 **[0080]** Aspect 5 provides the antiperspirant composition of any one of Aspects 1-4,  
 wherein the aluminum salt comprises aluminum sesquichlorohydrate.
- [0081]** Aspect 6 provides the antiperspirant composition of any one of Aspects 1-5,  
 wherein the film former is in a range of from about 1 wt% to about 20 wt% of the active  
 component.
- 20 **[0082]** Aspect 7 provides the antiperspirant composition of any one of Aspects 1-6,  
 wherein the film former is in a range of from about 7 wt% to about 13 wt% of the active  
 component.
- [0083]** Aspect 8 provides the antiperspirant composition of any one of Aspects 1-7,  
 wherein the film former comprises Acrylates Copolymer, Acrylates Copolymer (and)  
 25 Acrylates/Polytrimethylsiloxymethacrylate Copolymer, ACRYLATES/  
 OCTYLACRYLAMIDE COPOLYMER, Acrylates/C1-2 Succinates/Hydroxyacrylates  
 Copolymer, Acrylates/C12-22 Alkyl Methacrylate Copolymer, Acrylates/Dimethicone  
 Copolymer, Acrylates/Ethylhexyl Acrylate Copolymer, Acrylates/Hydroxyesters Acrylates  
 Copolymer, Acrylates/Lauryl Acrylate/Stearyl Acrylate/Ethylamine Oxide Methacrylate  
 30 Copolymer, Acrylates/Octylacrylamide Copolymer  
 Acrylates/Polytrimethylsiloxymethacrylate Copolymer,  
 Acrylates/Polytrimethylsiloxymethacrylate Copolymer (and) Laureth-1 Phosphate,  
 Acrylates/t-Butylacrylamide Copolymer, Adipic Acid/Diglycol Crosspolymer, Adipic  
 Acid/Neopentyl Glycol/Trimellitic Anhydride Copolymer, Algin Aluminum Starch

OctenylsuccinateAMP-Acrylates Copolymer, Behenyl Methacrylate/t-Butyl Methacrylate Copolymer, Brassica Campestris/Aleurites Fordi Oil Copolymer, Butyl Acrylate/Hydroxypropyl Dimethicone Acrylate Copolymer, Butyl Ester of PVM/MA Copolymer, C24-28 Alkyldimethylsiloxy Trimethylsiloxysilicate, Capryloyl

5 Glycerin/Sebacic Acid Copolymer, Diisostearoyl Polyglyceryl-3 Dimer Dilinoleate, Ethyl Ester of PVM/MA Copolymer, Isobutylene/Ethylmaleimide/Hydroxyethylmaleimide Copolymer, Isopropyl Ester of PVM/MA Copolymer, Methacryloyl Ethyl Betaine/Acrylates Copolymer, Octylacrylamide/Acrylates/Butylaminoethyl Methacrylate Copolymer, Phenylpropyldimethylsiloxysilicate, Polyamide-3, Polyamide-8, Polyester-10, Polyester-7,

10 Polyethylene, Polymethylsilsesquioxane, Polyurethane-1, Polyurethane-14 (and) AMP-Acrylates Copolymer, Polyurethane-18, Polyurethane-34, Polyurethane-35, Polyurethane-48, Polyurethane-64, Polyurethane-93, Polyvinyl Stearyl Ether, PPG-17/IPDI/DMPA Copolymer, PPG-26/Dimer Dilinoleate Copolymer, Pullulan, PVP, PVP CROSSPOLYMER, Sodium Polyacrylate, Sodium Polystyrene Sulfonate, Styrene/Acrylates Copolymer,

15 Styrene/VP Copolymer, Triacontanyl PVP, Trifluoropropyldimethylsiloxy/Trimethylsiloxy Silsesquioxane, Trimethylpentanediol/Adipic Acid/Glycerin Crosspolymer, Trimethylsiloxysilicate, VA/Butyl, Maleate/Isobornyl Acrylate Copolymer, VA/Crotonates Copolymer, VA/Crotonates/Vinyl Neodecanoate Copolymer, Vinyl Caprolactam/VP/Dimethylaminoethyl Methacrylate Copolymer, VP/HEXADECENE

20 COPOLYMER, VP/Acrylates/Lauryl Methacrylate Copolymer, VP/Dimethylaminoethylmethacrylate Copolymer, VP/DMAPA Acrylates Copolymer, VP/Eicosene Copolymer, VP/Hexadecene Copolymer, VP/Methacrylamide/Vinyl Imidazole Copolymer, VP/VA Copolymer, VP/Vinyl Caprolactam/DMAPA Acrylates Copolymer, copolymers thereof, or mixtures thereof. In specific aspects, the film former can include

25 sodium polyacrylate.

**[0084]** Aspect 9 provides the antiperspirant composition of any one of Aspects 1-8, wherein the film former comprises sodium polyacrylate.

**[0085]** Aspect 10 provides the antiperspirant composition of any one of Aspects 1-9, wherein the extract is in a range of from about 0.10 wt% to about 5 wt% of the active

30 component.

**[0086]** Aspect 11 provides the antiperspirant composition of any one of Aspects 1-10, wherein the extract is in a range of from about 0.5 wt% to about 1.5 wt% of the active component.

[0087] Aspect 12 provides the antiperspirant composition of any one of Aspects 1-11, wherein the extract further comprises propanediol and glycerin.

[0088] Aspect 13 provides the antiperspirant composition of Aspect 12, wherein:  
the nymphaea coerulea flower extract is in a range of from about 0.00075 to about

5 0.04 wt% of the extract;

the nelumbo nucifera flower extract is in a range of from about 0.00075 to about 0.04 wt% of the extract;

the propanediol is in a range of from about 0.08 to about 4 wt% of the extract; and

the glycerin is in a range of from about 0.01 wt% to about 1 wt% of the extract.

10

[0089] Aspect 14 provides the antiperspirant composition of any one of Aspects 1-13, further comprising a solvent.

[0090] Aspect 15 provides the antiperspirant composition of Aspect 14, wherein the solvent comprises an organic solvent.

15 [0091] Aspect 16 provides the antiperspirant composition of any one of Aspects 14 or 15, wherein the solvent is in a range of from about 1 wt% to about 50 wt% of the active component.

[0092] Aspect 17 provides the antiperspirant composition of any one of Aspects 14-16, wherein the solvent is in a range of from about 30 wt% to about 40 wt% of the active  
20 component.

[0093] Aspect 18 provides the antiperspirant composition of any one of Aspects 14-17, wherein the solvent comprises a C12-C15 alkyl benzoate, isododecane, or a mixture thereof.

[0094] Aspect 19 provides the antiperspirant composition of Aspect 18, wherein the  
25 C12-C15 alkyl benzoate component comprises a C12 alkyl benzoate, a C13 alkyl benzoate, a C14 alkyl benzoate, a C15 alkyl benzoate, or a mixture thereof.

[0095] Aspect 20 provides the antiperspirant composition of any one of Aspects 1-19, wherein the antiperspirant composition is a stick antiperspirant, a body spray, a clear gel, or an aerosol antiperspirant.

30 [0096] Aspect 21 provides the antiperspirant composition of any one of Aspects 1-20, further comprising a perfume.

[0097] Aspect 22 provides the antiperspirant composition of Aspect 21, wherein the perfume is in a range of from about 0.001 wt% to about 8wt% of the active component.

[0098] Aspect 23 provides the antiperspirant composition of any one of Aspects 21 or 22, wherein the perfume is in a range of from about 0.01 wt% to about 0.05 wt% of the active component.

5 [0099] Aspect 24 provides the antiperspirant composition of any one of Aspects 1-23, further comprising a preservative.

[00100] Aspect 25 provides the antiperspirant composition of Aspect 24, wherein the preservative is present in a range of from about 0.0001 wt% to about 1 wt% of the active component.

10 [00101] Aspect 26 provides the antiperspirant composition of any one of Aspects 24 or 25, wherein the preservative is present in a range of from about 0.0003 wt% to about 0.1 wt% of the active component.

[00102] Aspect 27 provides the antiperspirant composition of any one of Aspects 1-26 further comprising an inactive component.

15 [00103] Aspect 28 provides the antiperspirant composition of Aspect 27, wherein the inactive component is in a range of from about 70 wt% to about 90 wt% of the antiperspirant composition.

[00104] Aspect 29 provides the antiperspirant composition of any one of Aspects 27 or 28, wherein the inactive component is in a range of from about 75 wt% to about 85 wt% of the antiperspirant composition.

20 [00105] Aspect 30 provides the antiperspirant composition of any one of Aspects 27-29, wherein the active component is in a range of from about 10 wt% to about 30 wt% of the composition.

25 [00106] Aspect 31 provides the antiperspirant composition of any one of Aspects 27-30, wherein the active component is in a range of from about 15 wt% to about 25 wt% of the composition.

[00107] Aspect 32 provides the antiperspirant composition of any one of Aspects 27-31, wherein the inactive component comprises a propellant.

30 [00108] Aspect 33 provides the antiperspirant composition of clam 32, wherein the propellant is present in a range of from about 15 wt% to about 100 wt% of the inactive component.

[00109] Aspect 34 provides the antiperspirant composition of any one of Aspects 32 or 33, wherein the propellant is present in a range of from about 80 wt% to about 95 wt% of the active component.

[00110] Aspect 35 provides the antiperspirant composition of any one of Aspects 1-34, wherein the inactive component further comprises a concentrate.

[00111] Aspect 36 provides the antiperspirant composition of Aspect 35, wherein the concentrate comprises an alcohol.

5 [00112] Aspect 37 provides the antiperspirant composition of any one of Aspects 1-36, wherein the inactive component further comprises a suspending agent.

[00113] Aspect 38 provides the antiperspirant composition of Aspect 37, wherein the suspending agent is in a range of from about 0.1 wt% to about 5 wt% of the inactive component.

10 [00114] Aspect 39 provides the antiperspirant composition of any one of Aspects 37 or 38, wherein the suspending agent is in a range of from about 0.1 wt% to about 2 wt% of the inactive component.

[00115] Aspect 40 provides the antiperspirant composition of any one of Aspects 1-39, wherein the magnesium salt comprises magnesium carbonate or magnesium chloride.

15 [00116] Aspect 41 provides the antiperspirant composition of any one of Aspects 1-40, wherein the active component comprises the aluminum salt, the film former and the extract solution.

[00117] Aspect 42 provides the antiperspirant composition of any one of Aspects 1-40, wherein the active component comprises the magnesium chloride, the film former and the  
20 extract solution.

[00118] Aspect 43 provides the antiperspirant composition of any one of Aspects 1-40, wherein the active component comprises the magnesium carbonate, the film former and the extract solution.

[00119] Aspect 44 provides an assembly comprising:  
25 a spray container; and  
the antiperspirant composition of any one of Aspects 1-43.

[00120] Aspect 45 provides an assembly comprising:  
a roll-on container; and  
the antiperspirant composition of any one of Aspects 1-43.

30

## CLAIMS

What is claimed is:

1. An antiperspirant composition comprising:  
an active component comprising:  
an aluminum salt, magnesium salt or a mixture thereof;  
a film former; and  
an extract solution comprising:  
nymphaea coerulea flower extract; and  
nelumbo nucifera flower extract.
2. The antiperspirant composition of Claim 1, wherein the aluminum salt, magnesium salt or a mixture thereof is in a range of from about 1 wt% to about 55 wt% of the active component.
3. The antiperspirant composition of any one of Claims 1 or 2, wherein the aluminum salt, magnesium salt or a mixture thereof is in a range of from about 15 wt% to about 45 wt% of the active component.
4. The antiperspirant composition of any one of Claims 1-3, wherein the aluminum salt comprises:  
 $Al_2(OH)_xQ_yXH_2O$ , wherein  
Q is chlorine, bromine or iodine; x is from about 2 to about 5, and  $x+y$ =about 6, and x and y do not need to be integers; and where X is from about 1 to about 6.
5. The antiperspirant composition of any one of Claims 1-4, wherein the aluminum salt comprises aluminum sesquichlorohydrate.
6. The antiperspirant composition of any one of Claims 1-5, wherein the film former is in a range of from about 1 wt% to about 20 wt% of the active component.
7. The antiperspirant composition of any one of Claims 1-6, wherein the film former is in a range of from about 7 wt% to about 13 wt% of the active component.
8. The antiperspirant composition of any one of Claims 1-7, wherein the film former comprises Acrylates Copolymer, Acrylates Copolymer (and) Acrylates/Polytrimethylsiloxymethacrylate Copolymer, ACRYLATES/

OCTYLACRYLAMIDE COPOLYMER, Acrylates/C1-2 Succinates/Hydroxyacrylates Copolymer, Acrylates/C12-22 Alkyl Methacrylate Copolymer, Acrylates/Dimethicone Copolymer, Acrylates/Ethylhexyl Acrylate Copolymer, Acrylates/Hydroxyesters Acrylates Copolymer, Acrylates/Lauryl Acrylate/Stearyl Acrylate/Ethylamine Oxide Methacrylate Copolymer, Acrylates/Octylacrylamide Copolymer, Acrylates/Polytrimethylsiloxymethacrylate Copolymer, Acrylates/Polytrimethylsiloxymethacrylate Copolymer (and) Laureth-1 Phosphate, Acrylates/t-Butylacrylamide Copolymer, Adipic Acid/Diglycol Crosspolymer, Adipic Acid/Neopentyl Glycol/Trimellitic Anhydride Copolymer, Algin Aluminum Starch OctenylsuccinateAMP-Acrylates Copolymer, Behenyl Methacrylate/t-Butyl Methacrylate Copolymer, Brassica Campestris/Aleurites Fordi Oil Copolymer, Butyl Acrylate/Hydroxypropyl Dimethicone Acrylate Copolymer, Butyl Ester of PVM/MA Copolymer, C24-28 Alkyldimethylsiloxy Trimethylsiloxysilicate, Capryloyl Glycerin/Sebacic Acid Copolymer, Diisostearyl Polyglyceryl-3 Dimer Dilinoleate, Ethyl Ester of PVM/MA Copolymer, Isobutylene/Ethylmaleimide/Hydroxyethylmaleimide Copolymer, Isopropyl Ester of PVM/MA Copolymer, Methacryloyl Ethyl Betaine/Acrylates Copolymer, Octylacrylamide/Acrylates/Butylaminoethyl Methacrylate Copolymer, Phenylpropyldimethylsiloxysilicate, Polyamide-3, Polyamide-8, Polyester-10, Polyester-7, Polyethylene, Polymethylsilsesquioxane, Polyurethane-1, Polyurethane-14 (and) AMP-Acrylates Copolymer, Polyurethane-18, Polyurethane-34, Polyurethane-35, Polyurethane-48, Polyurethane-64, Polyurethane-93, Polyvinyl Stearyl Ether, PPG-17/IPDI/DMPA Copolymer, PPG-26/Dimer Dilinoleate Copolymer, Pullulan, PVP, PVP CROSSPOLYMER, Sodium Polyacrylate, Sodium Polystyrene Sulfonate, Styrene/Acrylates Copolymer, Styrene/VP Copolymer, Triacontanyl PVP, Trifluoropropyldimethylsiloxy/Trimethylsiloxy Silsesquioxane, Trimethylpentanediol/Adipic Acid/Glycerin Crosspolymer, Trimethylsiloxysilicate, VA/Butyl, Maleate/Isobornyl Acrylate Copolymer, VA/Crotonates Copolymer, VA/Crotonates/Vinyl Neodecanoate Copolymer, Vinyl Caprolactam/VP/Dimethylaminoethyl Methacrylate Copolymer, VP/HEXADECENE COPOLYMER, VP/Acrylates/Lauryl Methacrylate Copolymer, VP/Dimethylaminoethylmethacrylate Copolymer, VP/DMAPA Acrylates Copolymer, VP/Eicosene Copolymer, VP/Hexadecene Copolymer, VP/Methacrylamide/Vinyl Imidazole Copolymer, VP/VA Copolymer, VP/Vinyl Caprolactam/DMAPA Acrylates Copolymer, copolymers thereof, or mixtures thereof. In specific claims, the film former can include sodium polyacrylate.



9. The antiperspirant composition of any one of Claims 1-8, wherein the film former comprises sodium polyacrylate.
10. The antiperspirant composition of any one of Claims 1-9, wherein the extract is in a range of from about 0.10 wt% to about 5 wt% of the active component.
11. The antiperspirant composition of any one of Claims 1-10, wherein the extract is in a range of from about 0.1 wt% to about 2 wt% of the active component.
12. The antiperspirant composition of any one of Claims 1-11, wherein the extract further comprises propanediol and glycerin.
13. The antiperspirant composition of Claim 12, wherein:
  - the nymphaea coerulea flower extract is in a range of from about 0.00075 to about 0.04 wt% of the extract;
  - the nelumbo nucifera flower extract is in a range of from about 0.00075 to about 0.04 wt% of the extract;
  - the propanediol is in a range of from about 0.08 to about 4 wt% of the extract; and
  - the glycerin is in a range of from about 0.01 wt% to about 1 wt% of the extract.
14. The antiperspirant composition of any one of Claims 1-13, further comprising a solvent.
15. The antiperspirant composition of Claim 14, wherein the solvent comprises an organic solvent.
16. The antiperspirant composition of any one of Claims 14 or 15, wherein the solvent is in a range of from about 1 wt% to about 50 wt% of the active component.
17. The antiperspirant composition of any one of Claims 14-16, wherein the solvent is in a range of from about 30 wt% to about 40 wt% of the active component.

18. The antiperspirant composition of any one of Claims 14-17, wherein the solvent comprises a C12-C15 alkyl benzoate, isododecane, or a mixture thereof.
19. The antiperspirant composition of Claim 18, wherein the C12-C15 alkyl benzoate component comprises a C12 alkyl benzoate, a C13 alkyl benzoate, a C14 alkyl benzoate, a C15 alkyl benzoate, or a mixture thereof.
20. The antiperspirant composition of any one of Claims 1-19, wherein the antiperspirant composition is a stick antiperspirant, a body spray, a clear gel, or an aerosol antiperspirant.
21. The antiperspirant composition of any one of Claims 1-20, further comprising a perfume.
22. The antiperspirant composition of Claim 21, wherein the perfume is in a range of from about 0.001 wt% to about 8 wt% of the active component.
23. The antiperspirant composition of any one of Claims 21 or 22, wherein the perfume is in a range of from about 0.01 wt% to about 0.05 wt% of the active component.
24. The antiperspirant composition of any one of Claims 1-23, further comprising a preservative.
25. The antiperspirant composition of Claim 24, wherein the preservative is present in a range of from about 0.0001 wt% to about 1 wt% of the active component.
26. The antiperspirant composition of any one of Claims 24 or 25, wherein the preservative is present in a range of from about 0.0003 wt% to about 0.1 wt% of the active component.
27. The antiperspirant composition of any one of Claims 1-26 further comprising an inactive component.
28. The antiperspirant composition of Claim 27, wherein the inactive component is in a range of from about 70 wt% to about 90 wt% of the antiperspirant composition.

29. The antiperspirant composition of any one of Claims 27 or 28, wherein the inactive component is in a range of from about 75 wt% to about 85 wt% of the antiperspirant composition.
30. The antiperspirant composition of any one of Claims 27-29, wherein the active component is in a range of from about 10 wt% to about 30 wt% of the composition.
31. The antiperspirant composition of any one of Claims 27-30, wherein the active component is in a range of from about 15 wt% to about 25 wt% of the composition.
32. The antiperspirant composition of any one of Claims 27-31, wherein the inactive component comprises a propellant.
33. The antiperspirant composition of claim 32, wherein the propellant is present in a range of from about 15 wt% to about 100 wt% of the inactive component.
34. The antiperspirant composition of any one of Claims 32 or 33, wherein the propellant is present in a range of from about 80 wt% to about 95 wt% of the active component.
35. The antiperspirant composition of any one of Claims 1-34, wherein the inactive component further comprises a concentrate.
36. The antiperspirant composition of Claim 35, wherein the concentrate comprises an alcohol.
37. The antiperspirant composition of any one of Claims 1-36, wherein the inactive component further comprises a suspending agent.
38. The antiperspirant composition of Claim 37, wherein the suspending agent is in a range of from about 0.1 wt% to about 5 wt% of the inactive component.
39. The antiperspirant composition of any one of Claims 37 or 38, wherein the suspending agent is in a range of from about 0.1 wt% to about 2 wt% of the inactive component.

40. The antiperspirant composition of any one of claims 1-39, wherein the magnesium salt comprises magnesium carbonate or magnesium chloride.
41. The antiperspirant composition of any one of claims 1-40, wherein the active component comprises the aluminum salt, the film former and the extract solution.
42. The antiperspirant composition of any one of claims 1-40, wherein the active component comprises the magnesium chloride, the film former and the extract solution.
43. The antiperspirant composition of any one of claims 1-40, wherein the active component comprises the magnesium carbonate, the film former and the extract solution.
44. An assembly comprising:  
a spray container; and  
the antiperspirant composition of any one of Claims 1-43.
45. An assembly comprising:  
a roll-on container; and  
the antiperspirant composition of any one of Claims 1-43.

**INTERNATIONAL SEARCH REPORT**

International application No  
**PCT/US2022/019827**

**A. CLASSIFICATION OF SUBJECT MATTER**  
**INV. A61K8/19 A61K8/26 A61K8/9789 A61Q15/00**  
**ADD.**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**  
 Minimum documentation searched (classification system followed by classification symbols)  
**A61K A61Q**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
**EPO-Internal**

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
<b>Y</b>	<b>Happi: "Balance Oily Skin With Nelupure", /, 27 October 2017 (2017-10-27), XP002806941, Retrieved from the Internet: URL:https://www.happi.com/contents/view_br eaking-news/2017-10-27/balance-oily-skin-w ith-nelupure/ [retrieved on 2022-06-21] the whole document</b>	<b>1-45</b>
<b>Y</b>	<b>DATABASE GNPD [Online] MINTEL; 19 August 2020 (2020-08-19), anonymous: "24h Anti-Perspirant Stick", XP055934202, Database accession no. 8036779 ingredient lists</b>	<b>1-45</b>

Further documents are listed in the continuation of Box C.       See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search <b>28 June 2022</b>	Date of mailing of the international search report <b>15/07/2022</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  <b>Briand, Benoit</b>
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2022/019827

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>DATABASE GNPD [Online] MINTEL; 24 June 2015 (2015-06-24), anonymous: "Qi Gong 24h Anti-Perspirant Spray", XP055934213, Database accession no. 3269099 see ingredients list</p> <p>-----</p>	1-45
Y	<p>WO 2017/070115 A1 (COTY INC [US]) 27 April 2017 (2017-04-27) page 8, line 32 - page 9, line 3; claims 1-2</p> <p>-----</p>	1-45

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

**PCT/US2022/019827**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
<b>WO 2017070115 A1</b>	<b>27-04-2017</b>	<b>DE 102016120103 A1</b>	<b>27-04-2017</b>
		<b>WO 2017070115 A1</b>	<b>27-04-2017</b>
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